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Figure 1. DNA and Amino Acid Sequences of the Diversified Region of Subtilisin.

Amino acid sequence of pre-pro peptide shown in small letters. Amino acid sequence of the mature peptide are shown in capital letters. Amino acid sequence of the diversified region are shown in capital, bold letters.

m kkplgkivas

-100 tallisvafs ssiasaaeea kekyligfne qeavsefveq veandevail

-50 seeeeveiel lhefetipvl svelspedvd aleldpaisy ieedaevttm

1 AQSVPWGISR VQAPAAHNRG LTGSGVKVAV LDTGISTHPD LNIRGGASFV

51 **PGE****STQ****DGN** **GHG****THV****AGTI** **AAL****NNS****IGVL** **GVAP****SAEL****YA** **VKVL****GASG****SG**

101 **SVSS****IAQ****GLE** **WAG****NNG****THVA** **NLS****LGSP****SPS** **ATLE****QAV****NSA** **TSRG****VLV****VAA**

151 **SGNS****GAG****SIS** **YPAR****YANA****MA** **VGAT****DQNN****NR** **ASFS****QYG****AGL** **DIVAP****GVNV****Q**

201 **STYP****GST****YAS** **LNGT****SMAT****PH** **VAGV****AAL****VKQ** **KNPS****WSNV****QI** **RNHL****KNT****TATS**

251 **LGST****NLYG****SG** **LVNA****EAA****TR**

# Subtilisin Structure-Function Correlation

## Thermostability Motifs

76

| Majority | 10         | 20         | 30         | 40         | 50       | 60       |     |
|----------|------------|------------|------------|------------|----------|----------|-----|
| 1a3.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 164 |
| 1a6.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1a7.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1a8.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1a9.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b1.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b2.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b3.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b4.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b5.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b6.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b7.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b8.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1b9.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1c1.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |
| 1c2.seq  | STODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 166 |

|              |           |           |            |            |            |          |          |     |
|--------------|-----------|-----------|------------|------------|------------|----------|----------|-----|
| Savilane.seq | GASFPGEPS | TODGNGHGT | HVAAGTVAAL | NSIGVIGVAP | SADLYAVKVL | LGANGRGS | VGIAQGLE | 193 |
|--------------|-----------|-----------|------------|------------|------------|----------|----------|-----|

| Majority | 70       | 80   | 90       | 100       | 110        | 120      |                   |
|----------|----------|------|----------|-----------|------------|----------|-------------------|
| 1a1.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a2.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a3.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a4.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a5.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a6.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a7.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a8.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1a9.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b1.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b2.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b3.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b4.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b5.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b6.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b7.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b8.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1b9.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1c1.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |
| 1c2.seq  | WAAANMMH | IANM | SLGSDAPS | TTLERAVNY | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD |

|              |           |           |            |            |          |                   |     |
|--------------|-----------|-----------|------------|------------|----------|-------------------|-----|
| Savilane.seq | WAGNNOHVA | NLSLGSPSP | SATLEQAVNS | ATSGVLLVIA | ATGNNGSG | SGVPARYANAMAVGATD | 128 |
|--------------|-----------|-----------|------------|------------|----------|-------------------|-----|

| Majority | 140      | 150    | 160    | 170    | 180       | 190    |                  |
|----------|----------|--------|--------|--------|-----------|--------|------------------|
| 1a1.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a2.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a3.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a4.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a5.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a6.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a7.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a8.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1a9.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b1.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b2.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b3.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b4.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b5.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b6.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b7.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b8.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1b9.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1c1.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |
| 1c2.seq  | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK |

|              |          |        |        |        |           |        |                  |     |
|--------------|----------|--------|--------|--------|-----------|--------|------------------|-----|
| Savilane.seq | QNNRRANF | SQYGTG | IDIVAP | PGVNVQ | STYPPGNRY | ASLNGT | SMATPHVAGAAALVVK | 180 |
|--------------|----------|--------|--------|--------|-----------|--------|------------------|-----|

QNNRRASFSQYGAU D I V A P G T N : Q S T Y P C S T Y A S L N U T J H A T P H V A S A A L V K K N P S H N N V X  
Zavitsae-sec

NAVJAG 481  
G A S F V P P E R S " Q D U N H G T H V A G T I A A L N N S I G V L G V A F S A B L Y A V K V L O A S U S S I A O U L S I N

NAME: M A G H N G H V A N L S L O S P E S A T L E Q A V N S A T S P C V L V A S G H S C A G S I S Y A B Y A N A M A V C T D 100

SAVINAE: 484

U N N N R A S P S Q Y J A G L D I V A P Q V N V Q S T Y P G S T Y A S L N G T S M A T P H V A G A A L V K C K N P S W S N V X